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INTERNATIONAL CONFERENCE ON RADIATIONLESS TRANSITIONS
HELD AT NEWPORT BEA. (U) CALIFORNIA UNIV IRVINE DEPT OF
CHEMISTRY E K LEE ET AL. 31 DEC 84 N00014-83-G-0178

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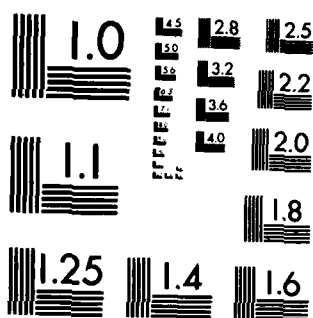
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FINAL REPORT

ON

International Conference on Radiationless Transitions

held at

The Hotel Newporter, Newport Beach, California

on

January 3-7, 1984

to

The Office of Naval Research

(N-00014-830G-0178)

Submitted by the Organizers:

Edward K.C. Lee

F. Sherwood Rowland

Max Wolfsberg

Department of Chemistry

University of California, Irvine, CA 92717

Report Prepared on May 17, 1984

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17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB. GR.	Conference support		
19. ABSTRACT (Continue on reverse if necessary and identify by block number) International Conference on Radiationless Transitions was held at the Hotel Newporter, Newport Beach, California, on January 3-7, 1984. Thirty long invited talks (30-20 minutes), 13 short talks (15-10 minutes), and 26 poster papers were presented. Topics presented in 9 half-day sessions (besides 2 poster sessions) were laser multiphoton ionization, photo dissociation dynamics, theories on intramolecular dynamics, gas phase relaxation dynamics, condensed phase dynamics and laser-jet spectroscopy. The international scientists totaling 111 had exchanged recent scientific information and generated new ideas for future research with intense participation during the conference.					
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT UNCLASSIFIED/UNLIMITED <input checked="" type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS <input type="checkbox"/>			21. ABSTRACT SECURITY CLASSIFICATION		
22a. NAME OF RESPONSIBLE INDIVIDUAL Professor Edward K.C. Lee			22b. TELEPHONE NUMBER (Include Area Code) 714-856-6021		22c. OFFICE SYMBOL

The Local Organizing Committee consisting of
M.A. El-Sayed, University of California, Los Angeles
E.K.C. Lee, University of California, Irvine
F.S. Rowland, University of California, Irvine
C. Wittig, University of Southern California, Los Angeles
M. Wolfsberg, University of California, Irvine
A.H. Zewail, California Institute of Technology, Pasadena

arranged the scientific program attached as Appendix A. Thirty long invited talks (30-20 min), 13 short talks (15-10 min), and 26 poster papers were presented. One invited talk by Dr. A. Tramer was cancelled. The following main topics were presented in half day sessions:

Half-day sessions

Topic

- | | |
|---|---|
| 1 | Laser multiphoton ionization |
| 1 | Photodissociation and collision
dynamics |
| 2 | Theories on intramolecular dynamics |
| 2 | Gas phase relaxation dynamics |
| 2 | Condensed phase dynamics |
| 1 | Laser jet spectroscopy |

Additionally, there were two afternoon poster sessions.



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On the last day, there was an open discussion of the intramolecular dynamics of pyrazine led by A.H. Zewail and D.W. Pratt. Recent scientific information and new ideas for future research were exchanged with intense participation during the conference.

The total number of participants was 111 including 25 post-doctoral research associates and 20 graduate students. The list is attached as Appendix B.

The federal agencies appropriated funds for partial reimbursement of travel expenses for some invited speakers as follows:

AFOSR	\$ 4,550
NSF	3,500
ONR	<u>4,030</u>
 TOTAL	 \$12,080

Of this sum, \$12,000 was spent for partial reimbursement of the travel expenses of ten invited foreign speakers (\$6800) and twelve invited domestic speakers (\$5200).

A total of \$9908 was collected through registration fees and food payments (the costs for breakfast were included in the regular registration fee). This sum plus the remaining \$80 from the federal grants was used to cover conference costs for books of abstracts, postage, conference secretary (Mrs. M. Pellman), poster stands, hotel facility charges, and breakfast/lunches.

INTERNATIONAL CONFERENCE ON RADIATIONLESS TRANSITIONS

PROGRAM

MONDAY, JANUARY 2, 1984

2:00 P.M. Registration

6:00 P.M. Informal Reception

TUESDAY, JANUARY 3, 1984

8:30 A.M. - 12:00 Noon

OPENING REMARK

- A-1 (30 Min) E.W. Schlag
"Multiphoton Mass Spectrometry, Some Recent Applications"
- A-2 (30 Min) M.A. El-Sayed, D.A. Gobel, J.R. Morgan, and J. St. Pierre
"The Mechanism of Laser Multiphoton Ionization Dissociation by Two-Color (Pump-Pump) Picosecond Laser-Mass Spectrometric Techniques"
- A-3 (30 Min) J. Troe, H. Hippler, K.H. Hoyer, and K. Luther
"Kinetics of Multiphoton Ionization in Toluene and Cycloheptatriene"
- A-4 (30 Min) S. Leach and G. Dujardin
"Recent Studies on Radiationless Transitions and Dissociative Relaxation in Molecular Ions"

12:00 - 2:00 P.M. LUNCH

2:00 P.M. - 4:00 P.M. POSTER SESSION

- B-1 E.C. Apel and E.K.C. Lee
"Rovibronic Emission Locked Fluorescence Excitation Spectroscopy: A Selective Probe for Coriolis Perturbation in Rovibronic Levels of S_1 H_2CO "
- B-2 R. Copeland and D.R. Crosley
"Rotational Level Dependence of Electronic Energy Transfer in the $A^2\Pi^+$, $v'=0$ State of OH and OD"
- B-3 D. Diott, L. Schosser, T.J. Kosic and R.E. Cline, Jr.
"Vibrational Relaxation in Molecular Crystals at Low Temperatures"

- B-4 G. Dujardin, T. Govers and S. Leach
 "Complete Dissociation of a Triatomic Cation: Simultaneous or Sequential Process?"
- B-5 B. Fain and S.H. Lin
 "Non-Equilibrium Phonons in Rate Processes"
- B-6 J. Shiraishi, Y. Fujimura and T. Nakajima
 "Mechanism of Resonant Two-photon Transitions via Repulsive Intermediate States. An Experimental and Theoretical Study on I_2 in Vapor"
- B-7 S.A. Mitchell and Peter Hackett
 "Pump and Probe Experiments on the Visible Dye Laser Induced MPD of Gallium Trimethyl"
- B-8 R.J. Brudzynski, P. Felder, R.J. Buss, and Y.T. Lee
 "Molecular Beam Study of the Unimolecular Decomposition of Toluene"
- B-9 P. Felder, R.J. Brudzynski, R.J. Buss and Y.T. Lee
 "Photodissociation of Isopropylcycloheptatriene at 266 nm"
- B-10 T.K. Minton, P. Felder, R.J. Brudzynski, and Y.T. Lee
 "Photodissociation of 1,2-Chloroiodoethane"
- B-11 J.K. McVey
 "Relaxation Dynamics in Isolated Hydrogen-Bonded Dimers"
- B-12 V. Lejeune, A. Despres, and E. Migirdicyan
 "Site Selection Spectroscopy of the Non-Kekule m-xylylene Biradical and its Methylated Derivatives"
- B-13 Y. Matsumoto, L.H. Spangler, and D.W. Pratt
 "Magnetic Field Effects on Intersystem Crossing"
- B-14 I. Oref
 "Statistical transition Probabilities and the Dynamics of Vibrational Energy Transfer in Reacting Systems"

4:00 - 5:30 P.M.

- C-1 (30 Min) Y.T. Lee, D.M. Newmark^u, A.W. Wodtke, and G.N. Robinson
 "The Observation of Dynamic Resonances in the $F + H_2$ Reaction"
- C-2 (30 Min) I. Tanaka, K. Tsukiyama, K. Shibuya, and K. Obi
 "Photodynamics of NO_2 in the 1^2B_2 and 2^2B_2 States"

8:00 - 10:00 P.M.

SOCIAL

WEDNESDAY, JANUARY 4

8:30 A.M. - 12:00 Noon

- D-1 (30 Min) R.M. Hochstrasser
"Vibrational Energy Redistribution in Molecular Solids"
- D-2 (20 Min) S.H. Lin and H. Kono
"Theoretical Studies of Photophysical Processes of
Impurity Molecules in Solids"
- D-3 (10 Min) Raoul Kopelman
"Fractal Energy Transport"
- D-4 (30 Min) V.E. Bondybey
"Nonradiative Relaxation and Vibrational Energy Redistri-
bution in Large Molecules"
- D-5 (15 Min) M. Kasha
"Radiationless Mechanisms in Proton-Transfer
Spectroscopy"
- D-6 (20 Min) D. Huppert, E. Helinski, and P.M. Rentzepis
"Effect of Solvent Dielectric Relaxation on Intramole-
cular Electron Transfer"

12:00 - 2:00 P.M.

LUNCH

4:00 - 6:00 P.M.

POSTER SESSION

- E-1 M. Noble and E.K.C. Lee
"Vibrational Mode Specificity in the Nonradiative Decay
Rates of Jet-Cooled S_1 Acetaldehyde"
- E-2 A.E. Bruno and R.P. Steer
"Radiationless Transitions on Thioformaldehyde, Thio-
acetaldehyde and Thioacetone Excited to Single Vibronic
Levels of Their First Excited Singlet States"
- E-3 P. Boczar, S.A. Schwartz, and M.R. Topp
"Vibrational Relaxation Studies in Matrices and Jets"
- E-4 R.B. Weisman
"Time-resolved Electronic and Vibrational Spectroscopy of
Excited Azabenzenes"
- E-5 D.W. Boldridge, B.L. Justus, and G.W. Scott
"Radiationless Decay Kinetics of the Lowest Energy
Excited Singlet State ($n\pi^*$) of the Naphthaldehydes"

- E-6 R.L. Whetten, C.E. Otis, K.-J. Fu, and E.R. Grant
 "Measurements of Ultrafast Decay of Molecular Rydberg States"
- E-7 L. Bigio, R.L. Whetten, R.S. Tapper, and E.R. Grant
 "Dynamics of Resonant Two-Photon Excitation: Evidence for the Effects of Intermediate Intramolecular Relaxation"
- E-8 I. Nadler, H. Reisler, and C. Wittig
 "The Photodissociation of NCNO Following $\pi \rightarrow \pi^*$ Excitation with a Tunable Dye Laser"
- E-9 D. Kelley
 "Dynamics of Iodine Geminate Recombination via Excited Electronic States"
- E-10 J. Wessel, E.L. Loper, and D.M. Mordaunt
 "Molecular Detection by Multiphoton Photoionization with Selective Ion Photofragmentation"
- E-11 D.M. Rayner and P.A. Hackett
 "Investigation of IR MPD Dynamics by Time Resolved Multiphoton Ionization Techniques"
- E-12 S. Wallace

8:00 - 10:00 P.M.

- F-1 (30 Min) C.S. Parmenter, D.A. Dolson, R.A. Coveleskie, K.W. Holcelaw, and B. Stone
 "The Dynamics of Vibrational Redistribution in Some Aromatic Molecules"
- F-2 (20 Min) E.C. Lim, S.L. Wang, and I.C. Khoo
 "Dynamics of Coherent and Incoherent Emission from a Single Molecule"
- F-3 (30 Min) J. Kommandeur
 "Molecular Eigenstates and Decays of Rotational States of Pyrazine"

10:00 P.M.

SOCIAL

THURSDAY, JANUARY, 5

8:30 A.M. - 12:00 Noon

- G-1 (30 Min) R.D. Levine
"Intramolecular Dynamics via the Algebraic Approach"
- G-2 (30 Min) D.A. Ramsay
"The Application of Spectroscopy to the Study of
Interstate Perturbations"
- G-3 (30 Min) M. Quack
"Radiative and Radiationless Transitions in IR-Photo-
chemistry and IR-Multiphoton Excitation"
- G-4 (30 Min) H.J. Neusser
"Sub-Doppler Spectroscopy and Energy Randomization in
Polyatomic Molecules"

12:00 - 2:00 P.M.

LUNCH

8:00 - 10:00 P.M.

- H-1 (30 Min) M.D. Fayer
"Electronic Excitation Transport in Disordered Systems"
- H-2 (10 Min) D. Huppert and D. Rojansky
"Picosecond Study of the Role of Electronic Excitation
Diffusion in Energy Transfer Process in Solutions and
Solids"
- H-3 (30 Min) K.B. Eisenthal
"Chemistry on the Picosecond Time Scale"

10:00 P.M.

SOCIAL

FRIDAY, JANUARY 6

8:30 A.M. - 12:00 P.M.

- I-1 (30 Min) R.W. Field
"A Time Independent View of Intramolecular Vibrational
Redistribution: Coriolis Perturbations in Formaldehyde
and Quantum Chaos in Acetylene"
- I-2 (30 Min) A.H. Zewail
"Picosecond Dynamics of IVR: Quasiperiodic and
Statistical Behavior"
- I-3 (30 Min) R.A. Marcus
"Review of Some Concepts of Quasiperiodicity and Chaos"
- I-4 (15 Min) F.S. Rowland and P.J. Rogers
"Non-RRKM Decomposition Reactions Following Halogen Atom
Additions to Allylic Metallo-organic Compounds"
- I-5 (20 Min) C.B. Moore, D.J. Bamford, S.V. Filseth, and
M.F. Foltz
"Product Energy Distribution for Formaldehyde
Photofragmentation"

12:00 - 2:00 P.M.

LUNCH

2:00 - 5:00 P.M.

- J-1 (30 Min) R.N. Zare
"The Ebb and Flow of Energy in the Near UV Photolysis of
trans-HONO"
- J-2 (30 Min) C. Wittig
"The Development of Product States During Dissociation"
- J-3 (30 Min) R.N. Dixon
"The Influence of Rotational Angular Momentum on the
Predissociation of Some Small Polyatomic Molecules"
- J-4 (15 Min) H.S. Taylor and G. Hose
"Implications of the Existence of Quantum Analogue of
Classical Regular Motion on Molecular and Atomic
Spectra"
- J-5 (15 Min) S. Mukamel
"Anharmonic Molecular Spectra - Self Consistent Mode
Coupling, Nonlinear Maps and Quantum Chaoses."

7:00 P.M.

RECEPTION

8:00 P.M.

BANQUET

SATURDAY, JANUARY, 7

8:30 A.M. - 12:00 P.M.

- K-1 (30 Min) A. Tramer, C. Jouvét, J.M. LeBars, and
P. Millie
"Intermediate Case in Vibrational Energy Redistribution."
- K-2 (10 Min) E.R. Grant, R.L. Whetten, and G.S. Ezra
"Inverse Electronic Relaxation and Nonradiative Decay in
the Jahn-Teller Conical Intersection: Exact Nonadiabatic
Calculations in the Classical Limit"
- K-3 (10 Min) E.K.C. Lee, N.L. Garland, and E.C. Apel
"SRL Fluorescence Emission Studies of Vibrational Mixing
Induced by Coriolis Interaction: The Region of $E_{\text{vib}} =$
2200 - 3000 cm^{-1} in S_1 H_2CO "
- K-4 (10 Min) A.E.W. Knight and W.D. Lawrance
"Vibronic Perturbations in Electronic States and the
Manifestations of State Mixing"
- K-5 (30 Min) D.H. Levy, C.A. Haynam, C. Morfitt, and L. Young
"The Photophysics and Photochemistry of Molecular
Clusters"
- K-6 (20 Min) A. Amirav, M. Sonnenschein and J. Jortner
"Absorption Spectroscopy Fluorescence Spectroscopy and
Emission Quantum Yield Measurements of Large Molecules
in Planar Supersonic Expansions"
- K-7 (10 Min) R.P.H. Rettschnick, J.J.F. Ramaekers,
J. Langelaar, and H.J. Lips
"Dynamics of the Dissociation of Electronically Excited
Complexes of s-Tetrazine and Argon"

12:00 - 2:00 P.M.

LUNCH

2:00 - 4:00 P.M.

- L-1 (30 Min) R.E. Smalley
"Photoionization Probes of Radiationless Transitions"
- L-2 (15 Min) D. Phillips, A. Autry, and A. Jones
"Time Resolved Fluorescence from a Jet-Cooled Bridged
Aromatic Molecule"
- L-3 (15 Min) M. Wolfsberg, C.L. Chen and B. Maessen
"Variational Calculations of Rotational-Vibrational
Energy Levels of Polyatomic Molecules"
- L-4 (30 Min) S.A. Rice and T.A. Stevenson
"Energy Redistribution in Electronically Excited
He-Benzene and Ar-Benzene van der Waals Molecules"

ATTENDEES AT THE
INTERNATIONAL CONFERENCE ON RADIATIONLESS TRANSITIONS

Dr. A. Amirav
Department of Chemistry
Tel Aviv University
Ramat Aviv, Tel Aviv, Israel

Eric C. Apel
Department of Chemistry
University of California
Irvine, Ca. 92717 USA

Professor V. A. Apkarian
Department of Chemistry
University of California
Irvine, Ca. 92717 USA

Professor G. H. Atkinson
Department of Chemistry
University of Arizona
Tucson, Az. 85721 USA

D. J. Bamford
Department of Chemistry
University of California
Berkeley, Ca. 94720 USA

D. Boldridge
Department of Chemistry
University of California
Riverside, Ca. 92521 USA

Dr. V. E. Bondybey
Bell Laboratories
Murray Hill, N. J. 07974 USA

Steven Buelow
Department of Chemistry
University of Southern California
Los Angeles, Ca. 90007 USA

A. Butz
Department of Chemistry
University of California
Riverside, Ca. 92521 USA

Dr. R. Brudzynski
Lawrence Berkeley Laboratory
University of California
Berkeley, Ca. 94728 USA

Jim Son Chou
Department of Chemistry
University of Southern California
Los Angeles, Ca. 90007 USA

Dr. G. Comtet
Department of Chemistry
University of California
Los Angeles, Ca. 90024 USA

Dr. R. A. Copeland
S R I International
Molecular Physics Laboratory
Menlo Park, Ca. 94025 USA

Liem Dang
Department of Chemistry
University of California
Irvine, Ca. 92717 USA

Professor R. N. Dixon
School of Chemistry
University of Bristol
B58 1TS, England

Mr. E. Drollinger
E.G. & G. Instruments
22971 Triton Way
Laguna Hills, Ca. USA

Dr. G. Dujardin
Laboratoire de Photophysique
Moléculaire
Université de Paris Sud
91405 Orsay Cedex, France

Professor K. B. Eisenthal
Department of Chemistry
Columbia University
New York, N. Y. 10027 USA

Professor M. A. El-Sayed
Department of Chemistry
University of California
Los Angeles, Ca. 90024 USA

Dr. M. Ensminger
Chevron Oil Field Research Corp.
La Habra, Ca. USA

**ATTENDEES AT THE
INTERNATIONAL CONFERENCE ON RADIATIONLESS TRANSITIONS**

Professor B. Fain
Department of Chemistry
Arizona State University
Tempe, Az. 85287 USA

Professor M. D. Fayer
Department of Chemistry
Stanford University
Stanford, Ca. 94305 USA

Dr. F. Felder
Lawrence Berkeley Laboratory
University of California
Berkeley, Ca. 94720 USA

Professor R. W. Field
Department of Chemistry
Mass. Institute of Technology
Cambridge, Mass. 82138 USA

Professor S. V. Filseth
Department of Chemistry
York University
Toronto, Canada

Professor Y. Fujimura
Department of Chemistry
Faculty of Science
Tohoku University
Sendai, 980 Japan

Dr. N. L. Garland
S R I International
Menlo Park, Ca. 94025 USA

Dr. D. A. Gilmore
Department of Chemistry
University of Arizona
Tucson, Az. 85721 USA

Dr. Gobeli
Department of Chemistry
University of California
Los Angeles, Ca. 90024 USA

Dr. N. Goldstein
Department of Chemistry
University of Arizona
Tucson, Az. 85721 USA

Professor E. R. Grant
Baker Laboratory of Chemistry
Cornell University
Ithaca, N. Y. 14853 USA

Dr. I. Grieger
Department of Chemistry
University of Arizona
Tucson, Az. 85721 USA

Dr. P. A. Hackett
Division of Chemistry
National Research Council
of Canada
180 Sussex Drive
Ottawa, Ontario, K1A 0R6

Professor J. C. Hemminger
Department of Chemistry
University of California
Irvine, Ca. 92717 USA

Professor R. M. Hochstrasser
Department of Chemistry
University of Pennsylvania
Philadelphia, Pa. 19104 USA

K.W. Holtzclaw
Department of Chemistry
Indiana University
Bloomington, Ind. 47405 USA

Dr. G. Hose
Department of Chemistry
University of Southern California
Los Angeles, Ca. 90007 USA

Dr. D. Huppert
Bell Laboratories
Murray Hill, N.J. 07974 USA

Dr. M. Irion
Department of Chemistry
University of California
Irvine, Ca. 92717 USA

ATTENDEES AT THE
INTERNATIONAL CONFERENCE ON RADIATIONLESS TRANSITIONS

Professor M. Kasha
Department of Chemistry
Florida State University
Tallahassee, Fla. 32306 USA

Professor D. F. Kelley
Department of Chemistry
University of California
Los Angeles, Ca. 90024 USA

Professor A. E. W. Knight
School of Science
Griffith University
Nathan, QLD, 4111 Australia

Professor J. Kommandeur
Laboratory for Phys. Chemistry
University of Groningen
Nijenborgh 16, 9747 AG
Groningen, The Netherlands

Dr. H. Kono
Department of Chemistry
Arizona State University
Tempe, Az 85827 USA

Professor R. Kopelman
Department of Chemistry
University of Michigan
Ann Arbor, Mi. 43109 USA

T. J. Kosic
School of Chemical Sciences
University of Illinois
Urbana, Ill. 61801 USA

* Mr. A. Kubski
Lumonics Incorporated
105 Schneider Road
Kanata, Ontario, Canada
K2K 1Y3

Dr. W. D. Lawrance
Department of Chemistry
University of California
Berkeley, Ca. 94720

Ms. B. Lawrence
Department of Chemistry
University of California
Irvine, Ca. 92717 USA

Professor S. Leach
Laboratoire de Photophysique
Moléculaire
Université de Paris Sud
91405 Orsay Cedex, France

Professor E. K. C. Lee
Department of Chemistry
University of California
Irvine, Ca. 92717 USA

Professor Y. T. Lee
Department of Chemistry
University of California
Berkeley, Ca. 94720 USA

Professor R. D. Levine
Department of Phys. Chemistry
Hebrew University
Jerusalem, Israel

Professor D. H. Levy
Department of Chemistry
University of Chicago
Chicago, Ill. 60637 USA

Professor S. H. Lin
Department of Chemistry
Arizona State University
Tempe, Az. 85281 USA

Professor K. Lindenberg
Department of Chemistry
University of California
San Diego, Ca. USA

Dr. Gary Loper
The Aerospace Corporation
Los Angeles, Ca. 90007 USA

Eric Lu
Department of Chemistry
University of California
Irvine, Ca. 92717 USA

Dr. Israel Nadler
Department of Chemistry
University of Southern Calif.
Los Angeles, Ca. 90007 USA

ATTENDEES AT THE
INTERNATIONAL CONFERENCE ON RADIATIONLESS TRANSITIONS

Dr. Bärbel Maessen
Department of Chemistry
University of California
Irvine, Ca. 92717 USA

Professor R. A. Marcus
Department of Chemistry
Calif. Institute of Technology
Pasadena, Ca. 91125 USA

Dr. P. Martin
Western Research
8616 Commerce Avenue
San Diego, Ca. USA

Dr. T. Minton
Lawrence Berkeley Laboratory
University of California
Berkeley, Ca. 94720 USA

Dr. M. J. Molina
Jet Propulsion Laboratory
4800 Oak Grove Drive
La Canada, Ca. 91109 USA

Professor C. B. Moore
Department of Chemistry
University of California
Berkeley, Ca. 94720 USA

Professor S. Mukamel
Department of Chemistry
University of Rochester
Rochester, N. Y. 14627 USA

Professor R. T. McIver
Department of Chemistry
University of California
Irvine, Ca. 92717 USA

Professor J. K. McVey
Department of Chemistry
Princeton University
Princeton, N. J. 08540 USA

Dr. M. Noble
Department of Chemistry
University of Southern California
Los Angeles, Ca. 90007 USA

D. O'Conner
Department of Chemistry
University of California
Riverside, Ca. 92521 USA

Professor I. Oref
Department of Chemistry
Technion
Haifa, Israel

Professor C. S. Parmenter
Department of Chemistry
Indiana University
Bloomington, Indiana 47401 USA

Professor D. Phillips
The Royal Institution
21 Albermarle Street
London, W1X 4BS U.K.

Professor D. W. Pratt
Department of Chemistry
University of Pittsburgh
Pittsburgh, Pa. 15260 USA

Professor M. Quack
Laboratorium fuer Physikalische
Chemie der ETH Zuerich
ETH-Zentrum, CH 8092
Zuerich, Switzerland

Dr. D. A. Ramsay
Herzberg Institute of
Astrophysics
National Research Council
of Canada
Ottawa, Ontario K1A 0R6
Canada

Dr. J. Reimers
Department of Chemistry
University of California
San Diego, Ca. USA

Dr. Hanna Reisler
Department of Chemistry
University of Southern California
Los Angeles, Ca. 90007 USA

ATTENDEES AT THE
INTERNATIONAL CONFERENCE ON RADIATIONLESS TRANSITIONS

Professor R.P.H. Rettschnick
Laboratory for Physical Chemistry
University of Amsterdam
Nieuwe Achtergracht 127
1018 WS Amsterdam, The Netherlands

Professor S. A. Rice
The James Franck Institute
University of Chicago
Chicago, Ill. 68637 USA

Ms. P. J. Rogers
Department of Chemistry
University of California
Irvine, Ca. 92717 USA

Professor F. S. Rowland
Department of Chemistry
University of California
Irvine, Ca. 92717 USA

Dr. Haruo Sato
Department of Chemistry
University of California
Irvine, Ca. 92717 USA

Professor E. W. Schlag
Lehrstuhl Physik. Chemie
Technische Universitat Munchen
D-8046 Garching, W. Germany

Professor G. W. Scott
Department of Chemistry
University of California
Riverside, Ca. 92521 USA

Dr. J. Selco
Department of Chemistry
Indiana University
Bloomington, Ind. 47405 USA

Dr. J. Simon
Department of Chemistry
University of California
Los Angeles, Ca. 90024 USA

Professor R. E. Smalley
Department of Chemistry
Rice University
Houston, Texas 77001 USA

Dr. J. Smedley
Department of Chemistry
University of Colorado
Boulder, Co. USA

Dr. Robert Stachnick
Jet Propulsion Laboratory
4800 Oak Grove Drive
La Canada, Ca. 91109 USA

Professor R. P. Stear
Department of Chemistry
University of Saskatchewan
Saskatoon, Saskatchewan
S7N 0W0 Canada

B. Stone
Department of Chemistry
Indiana University
Bloomington, Ind. 47405 USA

Dr. B. Swartz
Western Research
8616 Commerce Avenue
San Diego, Ca. USA

L. Tai
Department of Chemistry
University of California
Los Angeles. Ca. 90024 USA

Professor I. Tanaka
Department of Chemistry
Tokyo Institute of Technology
Ohokayama, Meguro-ku
Tokyo, 152 Japan

Professor H. S. Taylor
Department of Chemistry
University of Southern California
Los Angeles, Ca. 90007 USA

Xu Thuda
Department of Chemistry
University of Southern California
Los Angeles, Ca. 90007 USA

Professor M.R. Topp
Department of Chemistry
University of Pennsylvania
Philadelphia, Pa. 19104 USA

ATTENDEES AT THE
INTERNATIONAL CONFERENCE ON RADIATIONLESS TRANSITIONS

Professor J. Troe
Institute für Physik. Chemie
Universität Göttingen
Tammannstrasse 6
D-3400 Göttingen, W. Germany

Tai-ly Tso
Department of Chemistry
University of California
Irvine, Ca. 92717 USA

Professor H. von Weyssenhoff
Technische Universität
Hannover 3
Hannover, W. Germany

Professor S. Wallace
Department of Chemistry
University of Toronto
Ontario M5S 1A1 Canada

Dr. D. Wardlaw
Arthur Amos Noyes Laboratory
California Institute of Technology
Pasadena, Ca. 91125 USA

Professor R.B. Weisman
Department of Chemistry
Rice University
Houston Tex. 77251 USA

Dr. R. L. Whetten
Baker Laboratory of Chemistry
Cornell University
Ithaca, N. Y. 14853 USA

Professor E. Weitz
Department of Chemistry
Northwestern University
Evanston, Ill. 60201 USA

Dr. J. E. Wessel
The Aerospace Corporation
Los Angeles, Ca. 90007 USA

Professor C. Wittig
Department of Chemistry
University of Southern California
Los Angeles, Ca. 90007 USA

Professor M. Wolfsberg
Department of Chemistry
University of California
Irvine, Ca. 92717 USA

* Dr. K. Wood
COHERENT INC.
P. O. Box 10321
Palo Alto, Ca. 94303 USA

Ms. J. Yang
Department of Chemistry
University of California
Los Angeles, Ca. 90024 USA

Professor R.N. Zare
Department of Chemistry
Stanford University
Stanford, Ca. 94305 USA

Professor A. H. Zewail
Arthur Amos Noyes Laboratory
California Institute of Technology
Pasadena, Ca. 91125 USA